

d.) Remarks.

Claims 1-4 have been canceled, claims 5 and 6 have been amended, and new claims 7-9 have been added. Thus, claims 5-9 are currently pending. Briefly, claim 1 has been incorporated into claim 5 and claim 6 has been broken down into four separate claims. No new matter or new issues are raised with these amendments and new claims.

Remarks Regarding 35 U.S.C. § 103(a)

Claims 5 and 6 stand rejected, under 35 U.S.C. § 103(a), as allegedly obvious over Volz et al in view of Guerinot (5,846,821) et al and Haymore et al (EP 409,814). Applicant respectfully traverses this rejection.

Specifically, the Examiner asserts that Volz discloses a peptide fragment of formula HxHxxxCxxC (SEQ ID NO:1) in which Leu is present in the position of the peptide fragment corresponding to X³, and any of the 20 naturally-occurring amino acid residues in the positions of the other X variables. The examiner further asserts that claims 5 and 6 place Ile where Volz places Leu and that based on Guerinot's and Haymore's teachings, Leu and Ile can be substituted for each other without losing metal binding properties. Applicant respectfully disagrees. None of the pending claims recite peptides containing Ile in the X³ position, meaning that the prior art does not contain the elements of the claimed invention.

The Examiner further asserts that Volz allegedly teaches that the metal binding property of the peptide fragment resides in the presence of motifs of histidine and cysteine residues. Moreover, the Examiner asserts that Haymore, Guerinot and Volz teach that the residues between His and Cys are unimportant in the binding of peptide fragments to metals and therefore make the present application unpatentable. Applicant again respectfully disagrees with this conclusion.

The Examiner's conclusion rests on the false assumption that the present claims' disclosed X variables are irrelevant to the invention. To the contrary, the residues specified

in the claims create sequences of unique importance far from the teachings of the prior art, and there is support for this fact in the specification.

The specification states at page 4, lines 19-26, that “it is advantageous for at least one of the variables X^1 to X^6 in the sequence additionally to be, independently of one another, Lys or Arg. Further advantageous amino acids present in the variables X^1 to X^6 are Glu, Lys, Arg, Tyr, Cys, Lys, His, Asp or Met. The amino acids Cys, Glu, Lys, Tyr or Arg are preferably present, particularly preferably Cys. These amino acids contribute to the advantageous binding of the peptide fragments to the immobilized metal ions.” These advantages are the reason for the importance of the specific substituents disclosed in previous claim 5.

Moreover, the variables claimed in SEQ ID NO:2 through SEQ ID NO:5 of claims 6-9 are particularly preferred peptide fragments. See page 5, lines 23-31. Primary support for the importance of SEQ ID NO: 2 through 5 can be found in Example 6 of the specifications (page 19), which illustrates some of the experiments performed by the inventors. In these experiments, claimed SEQ ID NOs. 2, 3, 4 and 5 bind well to the nickel metal chelate column, whereas other tested variations on the $HxHxxxCxxC$ formula, show no binding. Specifically, SEQ ID NO:3 produced a protein yield of 56%, which is higher than the 48% with the his tags. SEQ ID NO:3 also showed preferred binding to Ni^{2+} and Cu^{2+} , while no binding to Zn^{2+} was observed. “On use of Ni chelate columns, the clone M13 [corresponding to SEQ ID NO:3] showed distinctly better purification of the proteins by comparison with the his tags. Conversely, the latter resulted in a purer product by comparison with M13 on use of Cu chelate columns.” (Specification page 20, lines 29-35.)

Accordingly, for all of these reasons, and all of the reasons set forth in Applicant's prior responses, the rejection of claims 5 and 6 under 35 U.S.C. § 103 (a), is overcome, and applicant respectfully requests that it be withdrawn.

Conclusion

In view of the foregoing amendments and/or remarks, reconsideration of the application and issuance of a Notice of Allowance is respectfully requested.

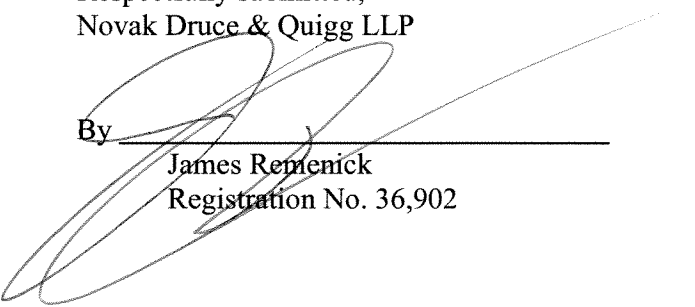
If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the number below.

Should additional fees be necessary in connection with the filing of this Responsive Amendment, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge **Deposit Account No. 14-1437 for any such fees**; and applicant hereby petitions for any needed extension of time not otherwise accounted for with this submission.

Respectfully submitted,
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By


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